

Amendments to the Specification:

Please replace paragraph [004] with the following amended paragraph:

[0004] In carrying out the invention in one aspect thereof, these objectives and advantages are obtained by providing a machine including a floor care appliance such as vacuum cleaner having a control arrangement for the propulsion unit. In the preferred embodiment of the present invention, a hall effect sensor and a magnet provide an output based upon the movement of the cleaner handle. The output from the hall effect sensor is input to a control circuit having a microprocessor which is programmed to output a signal to control the speed and direction of the transmission based on the output from the hall effect sensor. The microprocessor can be programmed such that the transmission has "response characteristics" that follow a mathematical expression or values from a data table based upon the movement of the handle by the user. With the use of programmable response characteristics more than one set of response characteristics can be programmed into the microprocessor. Through the use of a switch or other means a user can choose which response characteristics are suitable for their own personal preference when manipulating the handgrip to propel the cleaner.

Please replace paragraph [0014] with the following amended paragraph:

[0014] A self-propelled upright vacuum cleaner 10 according to a preferred embodiment of the present invention is diagrammatically illustrated by way of example in FIG. 1. The cleaner includes a foot or lower engaging portion 100. The vacuum cleaner 10 is of the type having

an agitator (not shown) and positioned within an agitator chamber (not shown) formed in an agitator housing which is part of foot 100. The agitator chamber (not shown) communicates with the nozzle opening (not shown) and the agitator (not shown) rotates about a horizontal axis inside the agitator chamber (not shown) for loosening dirt from the floor surface. The loosened dirt is drawn into a suction duct located behind and fluidly connected to agitator chamber (not shown) by a suction airstream generated by a motor-fan assembly (not shown). The suction duct (not shown) directs the loosened dirt to a dirt particle filtration and collecting system positioned in a handle or upper housing 200. Freely rotating support wheels 6 (only one of which is visible in FIG. 1) are located to the rear of the foot 100. The foot 100 further includes a transmission 108 and drive wheels 110 for propelling the cleaner 10 in forward and reverse over a floor. A rotary power source such as electric motor 105 provides rotary power to the transmission 108. The details of the transmission 108 do not form a part of the present invention and are therefore not disclosed in detail herein. However, a suitable transmission for use with a self-propelled upright vacuum cleaner according to the present invention is disclosed in U.S. Pat. No. 3,581,591, the disclosure of which is hereby incorporated by reference herein.

Please replace paragraph [0016] with the following amended paragraph:

[0016] In the preferred embodiment of the invention, a hand grip 114 is slidably mounted to a handle stem 116 that is attached to the upper end of the upper housing portion 200 for limited reciprocal rectilinear motion relative to the handle stem 114 as illustrated by arrows

F and R. The hand grip 114 controls the speed and direction of transmission 108 via an electronic switching arrangement. In the preferred embodiment of the present invention, the electronic switching arrangement is an analog linear hall effect sensor 310 located in proximity to a magnet 305 (shown best in FIG. 3). The hall effect sensor 310 generates a voltage the magnitude of which corresponds to the position of the sensor hall effect 310 in relation to the magnet 305. This information is input to a microprocessor 450 to control the speed and direction of the transmission motor 108. Movement of the handgrip 114 in the direction of arrow F causes an input to the microprocessor 450 to cause the cleaner 10 to be propelled in the direction of arrow F'. The speed by which the transmission 108 causes the cleaner 10 to be propelled is dependent on the movement of handgrip 114 in the direction of arrow F. The resultant speed as a function of the movement of handgrip 114 is pre-programmed into microprocessor 450.

Please replace paragraph [0018] with the following amended paragraph:

[0018] Referring now to FIG. 3, shown is a cutaway portion of the upper end of upper housing portion 200 with a portion of handgrip 114 further cutaway. A permanent magnet 305 is mounted on the interior sidewall of handgrip 114 and position in proximity to hall effect sensor 310. Hall effect sensor 310 mounted on the handle stem 116 such that magnet 305 moves relative to hall effect sensor 310 when handgrip 114 is translated in the direction of arrows F and R. Hall effect sensor 310 is connected to microprocessor 450 by wiring (not shown). A power switch button 304 is preferably located adjacent to a top of the handle stem 116 near

the hand grip 114 for convenient actuation of an electric power switch (not shown) for turning the cleaner 10 on and off. The electric power switch (not shown) controls the power supplied to a control circuit 400 and to microprocessor 450 being connected thereto by wiring (also not shown).

Please replace paragraph [0019] with the following amended paragraph:

[0019] Referring now to FIG. 4, an electrical schematic of the control circuit 400 for providing and controlling the power supplied to transmission motor 105 is shown. A 120 vac power source 405 is connected to a full Wheatstone bridge 407 to convert the alternating current to a 170 volt direct current. A 220 microfarad smoothing capacitor 409 smooths the direct current. A 2.2 K ohm resistor 411 and a 33 volt Zener diode 413 clamp the voltage to 33 volts which is input to a voltage regulator 415 which outputs a regulated 15 volts for supplying power to an H-Bridge Motor Driver 423. The H-Bridge Motor Driver 423 is of a well known type using field effect transistors (FET's) to control the current supplied to motor M. The fifteen volts is also inputted into a 5 volt voltage regulator which outputs a regulated 5 volts for supplying power to microprocessor 450. The output voltages from hall effect sensor 310 are input at pin 451 to microprocessor 450 which determines the magnitude and polarity of the voltages. The microprocessor 450 provides a pre-programmed output to L1, L2, H1 and H2 on H-Bridge Motor Driver 423. When a voltage is applied to H1 and L2, the motor M will rotate in the forward direction. Oppositely, when a voltage is applied to L1 and H2, the motor M will rotate in the reverse direction. In this manner, using pulse width modulation on L1, L2, H1 and H2,

the microprocessor 450 can control the speed of the motor M in both directions based upon the effort that the user places on the handle in the forward and reverse direction. If the user lightly pushes or pulls on the handle, the motor M can run slowly in the forward and reverse direction. Likewise, if the user heavily pushes or pulls on the handle, the motor M can run at a much greater speed in the forward and reverse direction. Based upon the effort placed upon the handle, the linear hall sensor 310 yields a different analog voltage, which in turn yields a different motor M speed. A charge pump circuit charges the external capacitors 432, 435[433] between the output pins OUT1 and OUT2 and the VB1 and VB2 pins. The capacitors 432, 435[433] provide enough voltage to the high side driver circuit to drive the high side MOSFET. The charging process is occurring when the output voltage is low. A pair of resistors 429, 431 and a pair of diodes 433, 434 form a current limiting circuit to limit the current flowing to VB1 and VB2. A resistor 427 connected to the low side output pin LS is used as a current sense to determine if a motor stall has occurred or not. If a stall has occurred, then the motor is shutdown. An RC circuit comprised of a resistor 425 and a capacitor 426 has the ability to shut itself down if the current through the system reaches a fixed level. The varying current in the system charges and discharges the RC network and when it hits a predetermined level based upon component selection the part shuts down. A pair of current limiting resistors 421, 422 limit the current between the forward F and reverse R outputs on microprocessor 450 and the inputs L1 and L2 on H-Bridge 423. In the preferred embodiment of the invention, the values of the various components are as follows: capacitor 409=220 micro farad; resistor 411=2.2 K ohm; diode 413=33 volt zener diode; capacitor 419=0.1 micro farad; diodes 433, 434=200 volt, 1 amp; resistors 429, 431=30 ohm; capacitors 432, 435[433]=4.7 micro farad; resistors

421, 422=10 K ohm; resistor 427=0.25 ohm; resistor 425=1 M ohm; and capacitor 426=220 micro farad.

Please replace paragraph [0025] with the following amended paragraph:

[0025] In another embodiment of the invention, two hall effect sensors with a single magnet could be utilized as a trigger arrangement with two voltages be inputted into microprocessor 450 for controlling the motor voltage and direction. Alternately, instead of a moving handgrip, a wheel sensor could be utilized to detect the movement of the cleaner suction nozzle when the pushes or pulls on the cleaner handle. The wheel sensor could sense the speed and detect both the amount of force transmitted to the suction nozzle via the handle and produce a representative voltage which is input to the microprocessor 450. The microprocessor 450 uses pulse width modulation on L1, L2, H1 and H2 to control direction and speed of motor M. Of course microprocessor 450 can be programmed to provide any desired output for motor M such as the output shown in FIGS. 5B-5C.